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THE HEALTH CARE INFRASTRUCTURE WITHIN NATIONAL HEALTH SYSTEMS

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A small child is carried by its mother into the room where immunizations are given to protect against measles, diphtheria, poliomyelitis, and other serious infectious diseases. This might be at a small village health station, in the polyclinic of a provincial town, or in the outpatient department of a big city hospital — anywhere in the world. At another health facility, a child with persistent diarrhoea is brought for care; the mother is given several packets of oral rehydration salts and taught how to use them for treatment of the child at home. At still another place, a sanitary inspector advises and assists a rural family on how to construct a safe and hygienic latrine.

Each of these episodes is one example of the *delivery of health care,* behind which there functions in every country a complex network of resources and activities that constitute a system — specifically, the health care infrastructure of a national health system.

Components of health care infrastructures

To provide or deliver health services of many types to its people, every country has developed over the years a *national health system,* just as it has developed systems for provision of education, transportation, or housing. In so far as the health system is concerned with protecting and improving health, it must depend on food, shelter, occupation, education, and many other social factors that influence health. With respect to its concern for *providing health services,* the health system has a health care *infrastructure,* which this pamphlet will try to explain.

Any social *system* is an interrelated combination of physical and human resources and functions that contribute to the performance of certain defined activities. The infrastructure of the health system functions to provide health services, such as immunization of a small child. In back of this relatively simple action there stands an *organized body,* such as a Ministry of Health or a Social Security Institute or perhaps a voluntary religious mission. This organization may be headquartered a long distance away, but it has made the arrangements for the building, the trained health worker, and the vaccine that made possible the baby's immunization. Usually Ministries of Health and sometimes other organized agencies maintain a pyramidal framework of authorities, extending from the national capital, through intermediate levels (province, districts, etc.), to local communities. The complexity of service usually increases at higher levels. Sometimes, the responsible entity may not be "organized" in the usual sense, but may be simply a private economic market, controlled by the interplay of supply and demand, price and competition.

But how was the health clinic constructed, the nurse or medical assistant trained, and the vaccine manufactured? Behind the agency there must be a whole complex of activities for *producing resources,* such as training skilled personnel, constructing facilities, fabricating drugs and supplies, and discovering the scientific knowledge and technology necessary to make an effective vaccine. Each of these activities obviously requires still further resources (for example, teachers and laboratories for training personnel) and great social effort.

Does this complete the account of the health care infrastructure? Hardly. None of these processes would operate in modern society without financing. There must be a source of *economic support* for all three of the chain of actions — the provision of resources, the organized programme operation, and the delivery of services. Health personnel must be paid for their work, administrative staff and teachers must be salaried, vaccines, needles, and refrigerators (to keep the vaccines potent) must be purchased. The necessary money may come from several sources. It may be raised by government taxes, it may be donated by charity, it may come from insurance contributions (voluntary or required by law), or it may simply be an expenditure of private individuals or families. Sometimes funds may come from several of these sources at the same time, and foreign aid may play a part in developing countries.

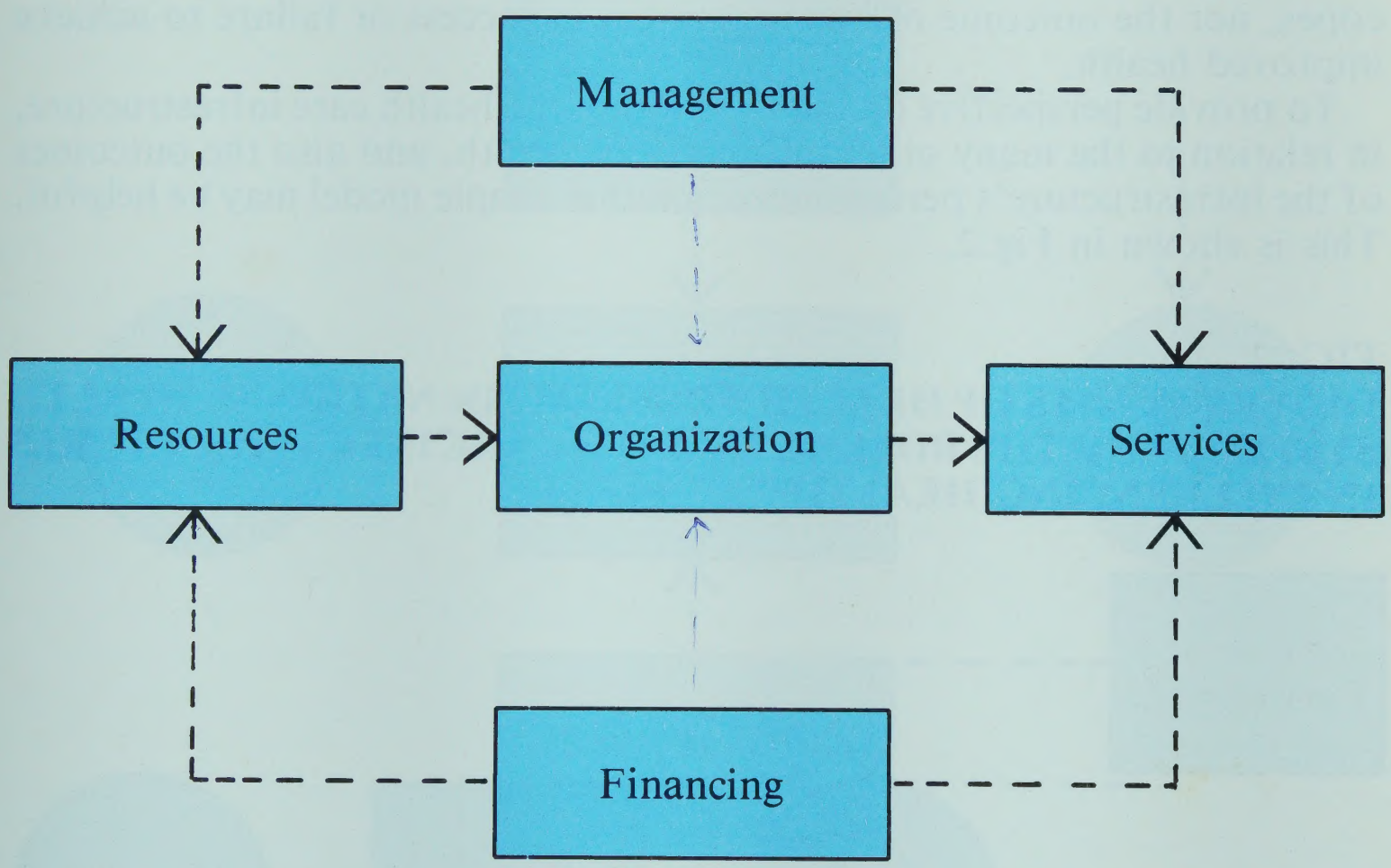
Still another form of support is needed if a health care infrastructure is to function properly — *managerial support*. All the above activities cannot be expected to work smoothly without some administration — delegation of authority and responsibility, some degree of supervision, maintenance of records, submission of reports, communication, and coordination. If immunizations or other services are to be assured over the years, there must be some type of planning. In so far as young people are trained to become nurses, for example, or raw biological products are converted into vaccines, there should be suitable standards of performance; these require regulation. After vaccines are given, can one be sure that they are effective? Are the infectious diseases prevented? This requires evaluation, which is not so easily done.

All these processes of management — administration, planning, regulation, and evaluation — may lie in the background and not be so visible, but they are essential parts of every health care infrastructure. The implementation of all these managerial processes may be carried out with varying degrees of authoritarianism as against democratic *community participation*. By involvement in health policy formulation and also in the implementation of programmes, community people can contribute to effective health services, as well as to enhancing their own appreciation and use of local health resources.

Health care infrastructure as a whole

Five essential components in the health care infrastructure of a national health system have been described, and it is obvious that they are interdependent. The small child would not receive the immunization — one example of the delivery of a health service — unless all four other components were functioning. The same would apply to the delivery or provision of countless other health services — the chlorination of a water supply, the treatment of an injury or a respiratory disorder, an appendectomy in a district hospital, or the computerized scanning of a patient's skull (for possible brain tumour) in a large medical centre. It may be helpful now to illustrate these five components in a health care infrastructure through a simple model — Fig.1.

FIG.1.
A HEALTH CARE INFRASTRUCTURE, SHOWING ITS MAIN COMPONENTS AND THEIR RELATIONSHIPS



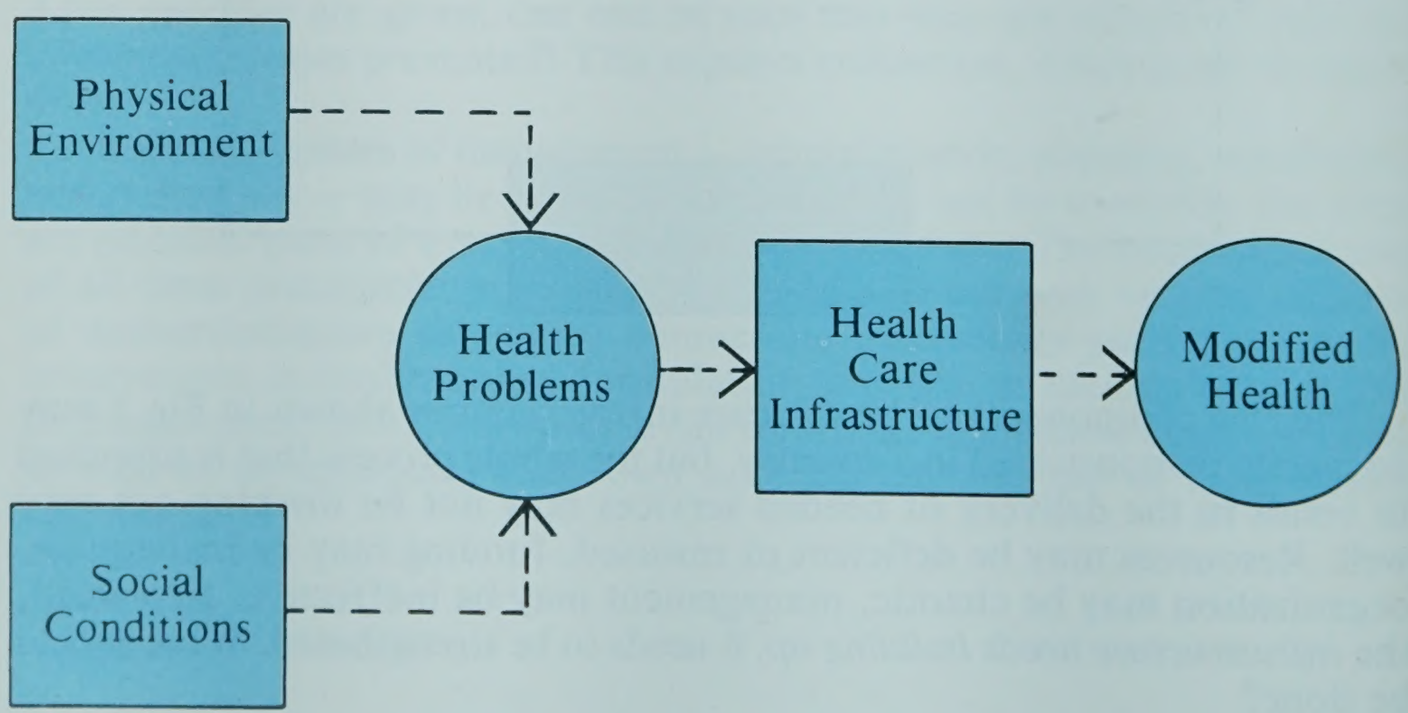
The five components of health care infrastructures shown in Fig.1 may be readily demonstrated in a country, but the whole process that is supposed to result in the delivery of needed services may not be working out very well. Resources may be deficient or misused, funding may be inadequate, organization may be chaotic, management may be ineffective. In a word, the *infrastructure needs building up,* it needs to be strengthened. What should be done?

To strengthen an infrastructure for health services requires first an identification of where the problems lie — a diagnosis of the situation. Very likely there are difficulties in several of the infrastructure components. To understand these fully requires analytical study or *health systems research.* Investigations should be made in all five of the infrastructure components. The findings of such research should give guidance to planning and then to broad programming. Tackling priority health problems — such as high malnutrition or the recurrence of malaria — will probably demand specific strategies that entail changes in several or all components. Actions are likely to be needed at several administrative levels — in local communities, intermediate jurisdictions, and at the principal headquarters of the whole organizational infrastructure.

The simple model in Fig.1 applies strictly to the health care infrastructure and takes account of none of the many other influences on health noted earlier. (Indeed, sometimes the term "infrastructure" is used in an even more restricted sense, to apply only to the components of "resources" and "organization" or sometimes "organization" alone.) Also Fig.1 does not show the place of health problems or disease, with which the infrastructure copes, nor the outcome of health services in success or failure to achieve improved health.

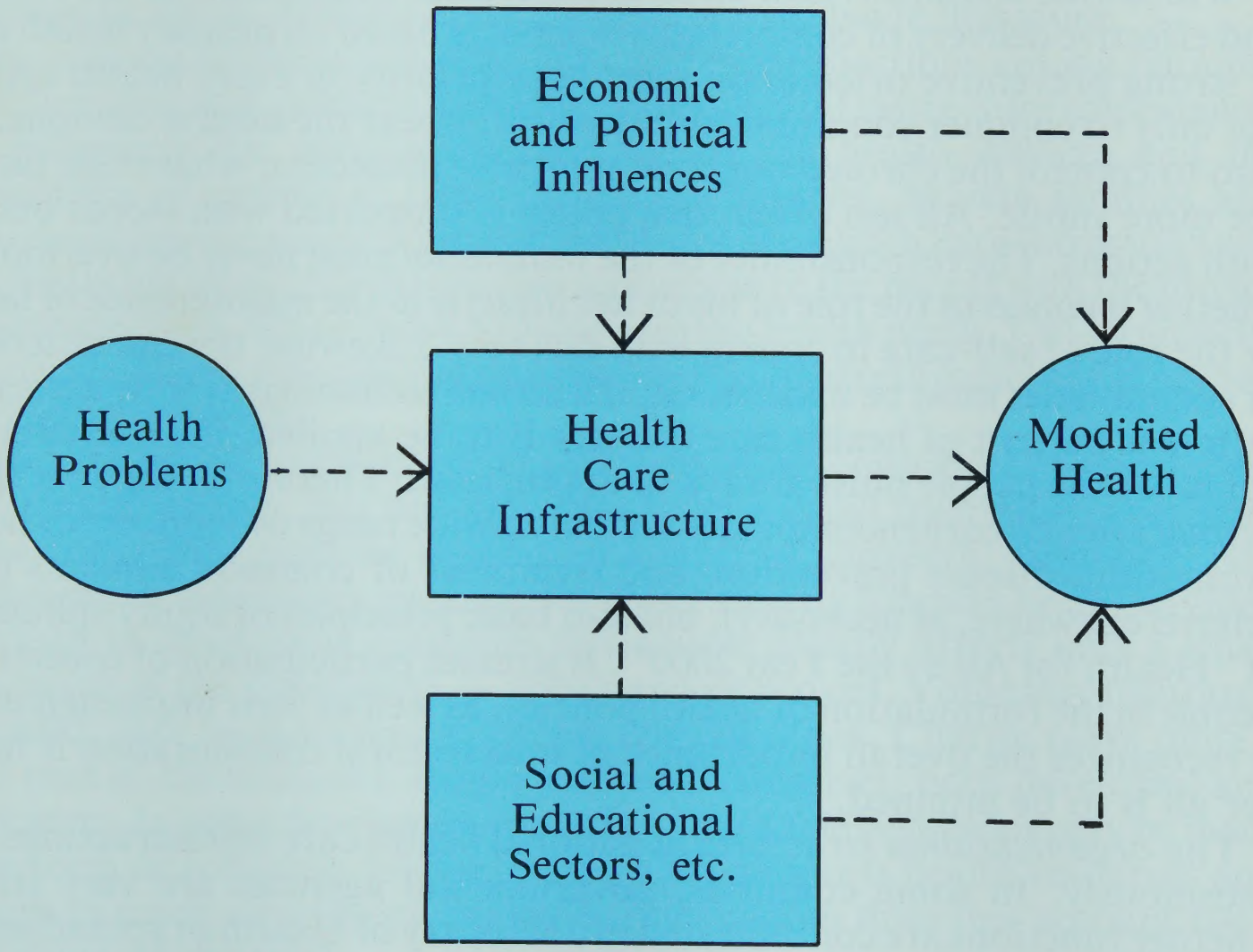
To provide perspective on the function of the health care infrastructure, in relation to the many other influences on health, and also the outcomes of the infrastructure's performance, another simple model may be helpful. This is shown in Fig.2.

FIG. 2.
DETERMINANTS OF HEALTH PROBLEMS IN NATIONAL HEALTH SYSTEMS AND THE ROLE OF HEALTH CARE INFRASTRUCTURES IN INFLUENCING HEALTH



The detailed contents of each of the five components in Fig.1 and also in Fig.2 vary greatly among different countries. The crucial places of the "physical environment" and "social conditions" in the creation of health problems (or the health status of a population) explains why the World Health Organization stresses *intersectoral collaboration* so much in the advancement of national health systems. For the same reason, achieving improvements in health depends on the collaborative influence of many economic and political forces and the contributions of many social sectors, including education, housing and other determinants of standards of living. The dynamics of these insectoral impacts on health are illustrated in Fig.3.

FIG.3
THE DYNAMICS OF MANY SECTORS INFLUENCING HEALTH IN NATIONAL HEALTH SYSTEMS



Variations in health care infrastructures

Focusing on the health care infrastructure in a country, there are certainly no two alike among the 165 countries of the world. The configurations in certain countries may, broadly speaking, resemble each other, but there are inevitably differences in the composition and magnitude of the elements that make up each of the five components. Some examples can clarify this.

Regarding the *delivery of services,* it is clear that this feature of a health care infrastructure includes all types of health services — first-level care (both preventive and therapeutic), secondary care, and tertiary care in sophisticated hospitals. The manner in which these services are delivered may vary greatly between countries and between different population groups in one country. Immunizations, for example, may be provided in public clinics, in schools, in private medical quarters, or even outdoors under a village tree. An appendectomy in a hospital may be performed by the official salaried surgeon on duty or by a personal surgeon, chosen by the patient and paid a private fee. The number and technological complexity of tertiary care (including rehabilitation) facilities vary greatly among countries. In some developing countries, these resources may be excessively and inappropriately developed, at the expense of great inadequacies in resources for first-level care. Hence, one can understand why WHO policy stresses *appropriate technology*. In one health system, *self-care* by the individual or family may be quite ignored, while in another, it is actively promoted through health education.

Worldwide consensus now stresses the crucial importance of an efficient and effective delivery of comprehensive services based on primary health care. A strong preventive orientation must have priority in every health system, not only to conquer communicable diseases, where the need is obvious, but also to control the chronic noncommunicable disorders, where risk factors are more subtle. All too often, this policy is supported with words but not with actions. The responsibility of the *individual* must never be overlooked, whether it concerns the role of his or her lifestyle in the maintenance of health or the role of self-care in coping with sickness. Likewise, the characteristics of communities must be understood; if a certain technology is to be acceptable or a new pattern of health care delivery is to be applied, the attitudes and values of the people must always be appreciated. Therefore, the concept of *primary health care* encompasses not only a wide range of services for health promotion, disease prevention, and treatment of common ailments (with referrel elsewhere, as necessary), but also basic principles of equity epitomized in "Health for All by the Year 2000". It stresses participation of community people in the formulation of health policies, as well as their implementation. It recognizes the overall importance of intersectoral collaboration if health for all is to be attained.

The *organizational structures* in national health care infrastructures vary enormously. In some countries, governmental agencies are very strong, whether functions are concentrated in a Ministry of Health or spread among several official bodies. The major responsibility for health care of the population is vested in government at various administrative levels. Below the central government, there are often provinces, districts, and local communities — with varying degrees of authority and responsibility. In other countries, the strength and responsibilities of governmental health agencies may be weak. The private market may be the dominant setting for health

services, and public bodies may play only a marginal role — limited largely to certain preventive and regulatory functions. Religious medical missions may be very important in some health care infrastructures and non-existent in others.

The quantities and types of *health resources* — personnel, facilities, supplies, etc. — in a health care infrastructure also show great variation. In large measure, these depend on a nation's wealth, but this is not the only determinant. With the political will to assign a high priority to health, some countries of a modest economic level may train much greater supplies of community health workers, physicians, nurses, or pharmacists than others at the same level. Health centres or rural health stations may be designed and staffed quite differently in various countries. The production of drugs in one system may be largely by domestic private pharmaceutical companies, in another system the drug supply may depend largely on foreign imports, and in still another drug production may be mainly a responsibility of government. Research to produce new medical knowledge is heavily concentrated in a relatively few countries, but all countries acquire new medical information by its dissemination through a worldwide literature.

The *sources of financing* show very diverse proportions among national health systems and, perhaps more than any other infrastructure component, this influences the population coverage of the health services and the accessibility of people to them. In many countries, private families and individuals are the major source of funds for the health care infrastructure; such financing inevitably means that services go to the people with the money to purchase them, not to those with the greatest health needs. Unfortunately, this source of economic support provides the lion's share in many of the poorest developing countries.

In all countries, government at different levels contributes financial aid to the health system, but this may vary from a small fraction to over 90% of the costs. In a growing number of countries, currently around 70, the mechanism of mandatory insurance or social security finances health services. Although in developing countries this source usually affects only a small proportion of the population — urban and employed. Voluntary insurance for health care is important in only a few countries. Charity plays quite a small part in the economic support of most countries, both developed and developing. In some developing countries, charitable donations may be made in the form of volunteer labour. Foreign aid supports health resources and services in many developing countries, but seldom does this account for a large share of the total.

The *managerial component* of national health care infrastructures is also highly variable. In some countries the system has highly centralized authority and is based on extensive planning. Others may be very decentralized, with little planning, and there are several stages in-between. Certain aspects of a health system may be centralized while others are decentralized. Community participation may permeate policy determination on these matters in varying degrees.

Regulation may be rigorous for certain health functions and not for others. Paradoxically, regulation may be quite sweeping where a free market in health service is large (to limit abuses), and may be quite limited where the delivery of services is mainly through governmental channels. In relatively few countries, is evaluation of the effects of the health system being carefully performed, but this feature of management is gradually becoming better developed. *Health systems research* is becoming more sophisticated in determining the impact on health of specific health services, compared to the influence of all the other sectors that affect health.

Health system improvement

With this great diversity in the characteristics of each of the major components of health care infrastructures, and with so many combinations of traits possible in different countries, one can appreciate that national health systems, as a whole, must show endless variety. The set of characteristics that defines the national health care infrastructure at any time and place depends on many social influences, as well as past history and tradition. Probably the most important determinants of system characteristics in a country are its level of economic development and its dominant political ideology. Both of these influences are constantly changing — sometimes, in a revolutionary period, quite rapidly — and with them the system changes.

In a philosophical sense, every country has the health care infrastructure that is suitable to its historical, economic, and political conditions. Being "suitable", however, does not mean that a system is the best possible one under stated conditions. Men and women are to a great extent masters of their own fate. Health systems can be improved by deliberate efforts, so that health services become more effective in meeting the health needs of the total population. It is for this reason that WHO calls for *"political will"* to promote the improvement of national health systems.

Often the initial step taken to promote health system improvement is action by government, on the one hand, to enhance the effectiveness and efficiency of performance of the health system and develop more effective management in its several aspects; on the other hand, to enlarge the economic support of the health care infrastructure. This may entail the allocation of greater public revenues to health activities, the mobilization of funds through social insurance, or other strategies. National health legislation is usually necessary. With greater financing, health agencies (especially Ministries of Health) can be strengthened. Health manpower and other resources can be expanded. These combined actions should lead to wider population coverage with comprehensive health services, based on primary health care. Such achievements can pave the way to Health for All.